



INSTRUCTION, OPERATION & MAINTENANCE MANUAL



CFD10K

CHARGE FREE 10,000 PSI PULSATION DAMPENER

This manual describes operating practices and maintenance procedures applicable to CFD10K series pulsation dampeners manufactured by Sigma Drilling Technologies. The information contained herein reflects recommendations based on industry best practices and recognized safety protocols. This manual is not a standards document. Use of the information and procedures contained in this manual is voluntary and is to be implemented at the sole discretion and risk of the user.

Sigma Drilling Technologies makes no warranties, expressed or implied, pertaining to the accuracy, completeness, or efficacy of recommendations presented in this manual. The user is at all times responsible for operating and maintaining CFD10K pulsation dampeners in a manner that is safe, conforms to the owner’s established business practices, and is in conformance with applicable regulations.

If at any time the user is unable to understand the recommendations made in this manual or is unable to follow those recommendations, they should consult with Sigma Drilling Technologies at the telephone number or email address listed at the bottom of this page.

All pulsation dampeners are designed to Section VIII Division I of the ASME Pressure Vessel Code.

MODEL	DESCRIPTION
CFD10KCS	Charge Free 10,000 PSI Discharge Pulsation Dampener – ASME Code Stamped
CFD10KNS	Charge Free 10,000 PSI Discharge Pulsation Dampener – NON-Code Stamped

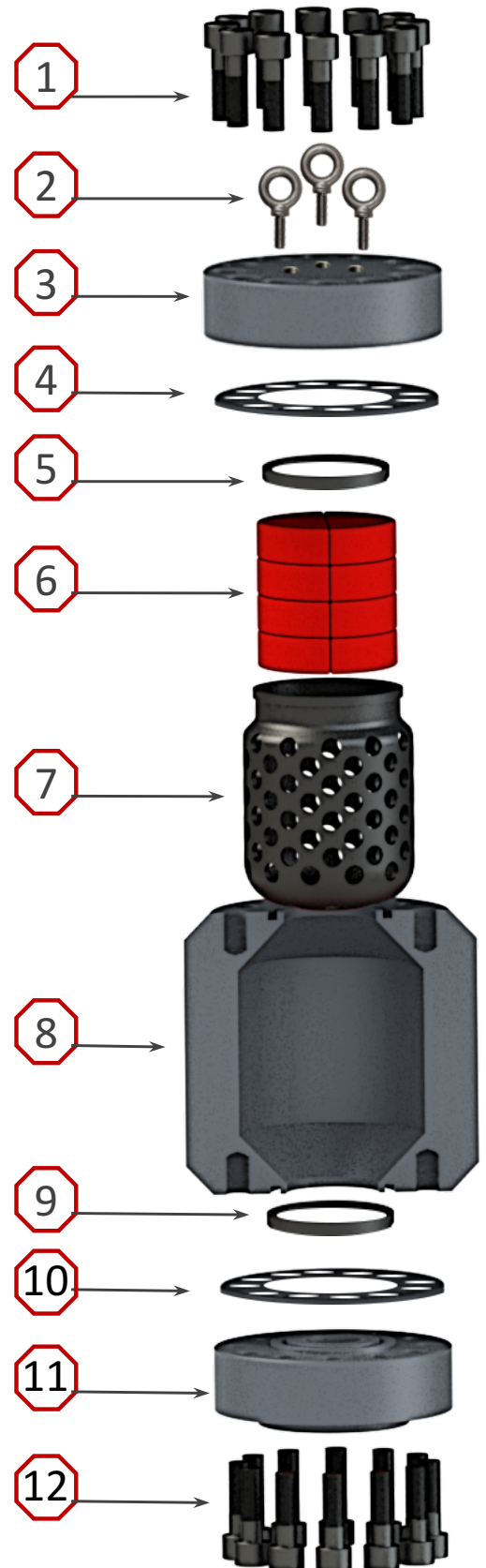
Dampeners are available with the following Diaphragms:

MATERIAL	PART NUMBER	TEMPERATURE RATINGS	
		CONTINUOUS	INTERMITTENT
HNBR	CFCKULTRA7500	0° F – 250° F (-18° C – 100° C)	300° (149° C)
Viton	CFCKVITON7500	0° F – 400° F (-18° C – 204° C)	450° (232° C)



For any questions, comments or concerns, please contact Sigma Drilling Technologies by phone at **281.565.9298**, by email at info@sigmadrillingtech.com or visit us at www.sigmadrillingtech.com

ITEM #	DESCRIPTION	PART #
1	Black Oxide Steel Cap Screw Fasteners	1504-0002-001R3
2	3/4" Shoulder Eyebolts	LFT-3/4EYE
3	CFD10K Top Head	1703-1700-003R0
4	Seal Ring	1710-1003-001R2
5	Secondary Seal, Gasket	1710-1003-002R1
6	Charge Free Dampening Load	ULTRALOAD7500
7a	Suspension Bag HNBR	RSB-20G-HNBR
7b	Suspension Bag Viton	RSB-20G-VITON
8	Tuned Charge Free Dampener Body	1703-1700-002R2
9	Secondary Seal, Gasket	1710-1003-002R1
10	Seal Ring	1710-1003-001R2
11	CFD10K Bottom Head	1703-1700-004R2
12	Black Oxide Steel Cap Screw Fasteners	1504-0002-001R3



*Item 11 is for 4-1/16" API 10k connection

Please read all instructions carefully before proceeding with the installation and operation of this equipment.

1.1 MOUNTING

- 1.1.1 The dampener should be mounted as close as possible to the pump for maximum effectiveness. As a general rule, install the dampener within a length not to exceed 10 times the connecting pipe diameter.
- 1.1.2 Mount the dampener vertically, and if possible in a position where the fluid stream is directed towards the opening in the connection flange located at the base of the vessel.
- 1.1.3 The fluid connection faces should be thoroughly cleaned and the API ring grooves checked for uniform sealing surfaces.
- 1.1.4 A new API ring (provided by others) should be cleaned, checked and coated with a light coat of lubricant before being installed in the mounting flange ring groove.
- 1.1.5 Insert the flange mounting studs (provided by others) into the 8 threaded holes in the bottom of CFD unit. All studs should be seated to ensure that they are properly inserted. There should be less than 0.25" (6 mm) variation in installed height.

WARNING-SAFETY HAZARD: *Do not lift anything other than the dampener with the three lifting eye bolts or material failure may occur. Prior to lifting, ensure cover plate is firmly attached.*

- 1.1.6 Install the API ring in the ring groove on the mating flange. Lower the dampener onto the mating flange. Ensure the space between the flange and dampener bottom connection is equal around the circumference.
- 1.1.7 Install the nuts and tighten using a star pattern to the gasket supplier's recommended torque.

BOLT SIZE	LUBRICATED TORQUE	
	FT-LB	NEWTON-METERS
IN		
1-7/8-8 NC x 6" long	2,000 ft-lb	2,720 nm

Torque values are for Sigma Drilling Technologies' Onyx coated bolting. If using a lubricant, consult lubricant supplier or contact Sigma for new torque values.

2.1 SUGGESTED INSPECTION AND REPLACEMENT PROCEDURES

If you have a suspicion that chemicals such as benzene are present in your drilling fluids, a quarterly schedule should be followed. If not, bi-yearly inspection is sufficient.

WARNING-SAFETY HAZARD: Before inspection, bring the system pressure down to 0 PSIG. Never loosen any bolting while system is under pressure.

2.1.1 Install provided eyebolts into cover plate.



2.1.3 Install Sigma Pole (Sigma Service Kit), through the cover plate, into the body of the dampener. If not utilizing a Sigma Service Kit, you will need to use an appropriate lifting arm.

2.1.4 Connect hoist to Sigma Pole's lifting arm (Sigma Service Kit) and attach three leg chain sling (Sigma Service Kit) to the installed eye bolts in the cover plate.

2.1.2 Using a star pattern, loosen the black oxide steel cap screws and remove.



- 2.1.5 Lift and rotate dampener cover plate around the Sigma Pole (Sigma Service Kit) and out of the way.



2.1.6

- a) Remove all wedges from the suspension bag. There will be eight (8) ported wedges and eight (8) solid wedges. The wedges have a urethane coating over a skinned nitrile coating.



- b) Visually inspect the wedges for reduced volume due to separation. If a wedge has been separated or is missing any volume, discard and replace wedge(s).



2.1.7

- a) Visually inspect the suspension bag inside the dampener. The suspension bag should be in one piece without tears. *Removing the bag from dampener can cause damage requiring a replacement.*



- b) If suspension bag is torn, discard and replace.

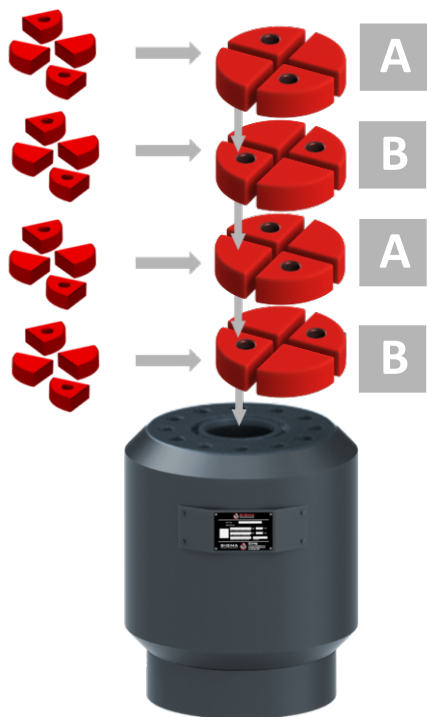


2.1.9

- a) Visually inspect cover plate seals. If you see any physical damage to the sealing surface, discard and replace with new seals.



- 2.1.8 Replace wedges in A/B pattern inside suspension bag.



- b) If you see any physical damage to the sealing surface, discard and replace with new seals.



2.1.10 Rotate dampener cover plate back around the Sigma Pole (Sigma Service Kit) and lower it in to place on dampener.



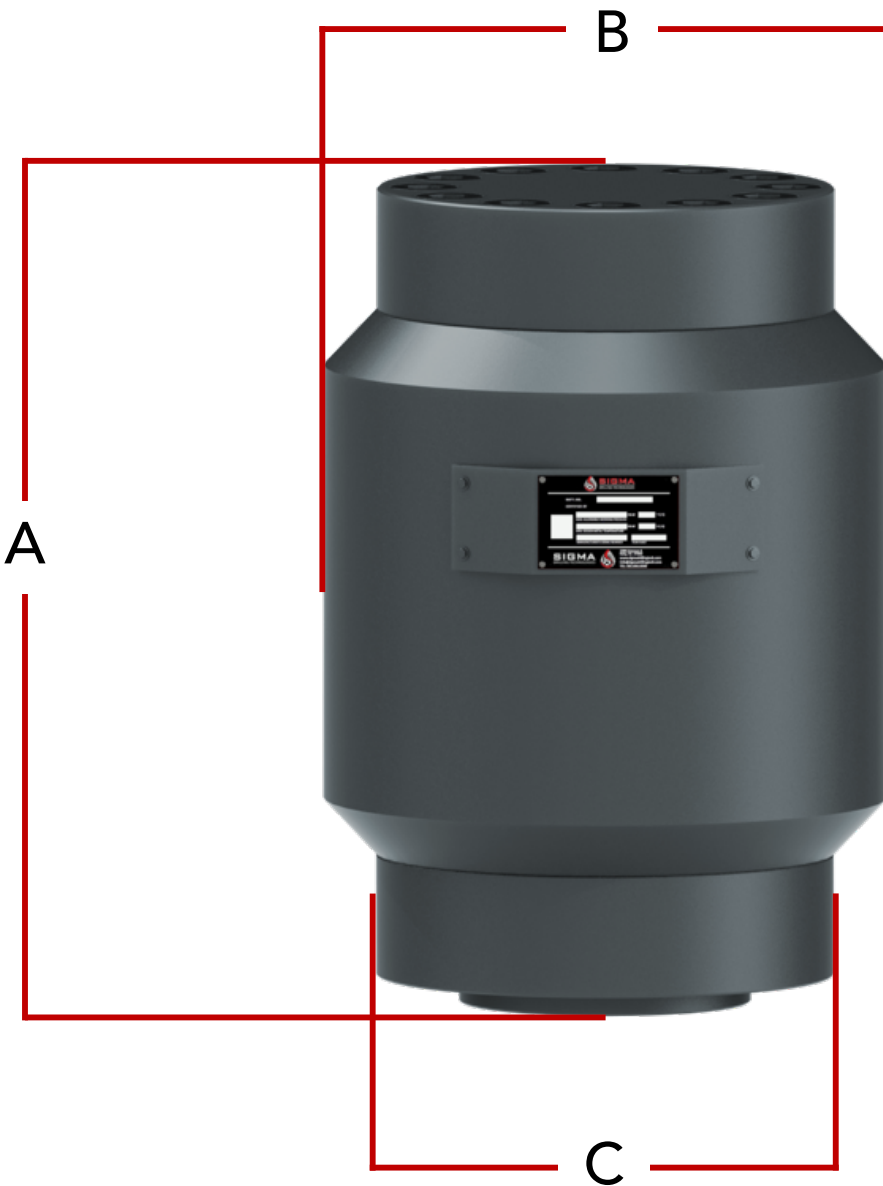
2.1.12 Remove and store eye bolts.



2.1.11 Remove Sigma Pole (Sigma Service Kit) and reinstall black oxide steel cap screws. Re-torque in star pattern to 2,000 ft-lb



A	≈37 in
B	≈25 in
C	≈20 in
WEIGHT	≈3200 lbs
MAX OPERATING PSI	10,000 psi



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OR QUESTIONS CONCERNING THE INFORMATION IN THIS MANUAL.

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